Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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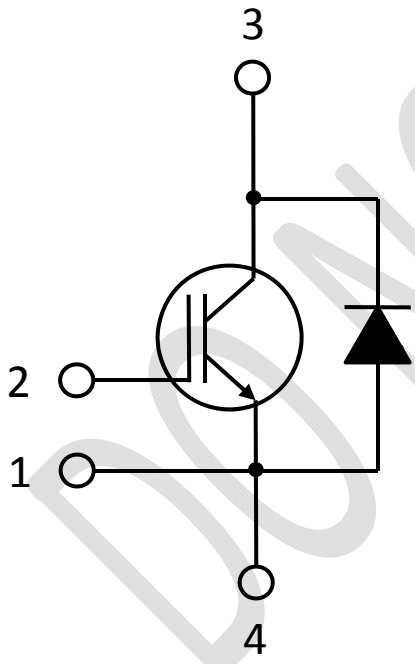
COPACK (Si IGBT/SiC SBD) SOT-227 Power Module

V_{CES} =1250V
I_C = 100A @T_C= 100^{0}C
$V_{CE(SAT)}$ = 1.8V



Features

- **High speed switching IGBT**
- Freewheeling diode with zero reverse recovery SiC SBDs
- **Low collector to emitter saturation voltage**
- Short circuit withstanding s time (10 µs min.)
- Kelvin reference for stable gate driving
- High junction temperature operation
- Positive temperature coefficient for easy to parallel mounting

Applications

- Photo Voltaic Inverter
- Aerospace actuators
- Server Power supplies
- High voltage AC/DC Converter
- Inductive heating and welding machine

RoHS

Benefits

- Outstanding power conversion efficiency at high switching frequency operation
- Low switching losses and Low EMI noises
- Very rugged and easy mount
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive T_C of V_F
- RoHS Compliant

Absolute Maximum Ratings (T_j=25°C unless otherwise specified)

Parameters	Symbol	Conditions	Specifications	Units
Si IGBT				
Maximum Collector-Emitter Voltage	V_{CES}	T_j = 25 °C~150 °C	1250	V
Continuous Collector Current	I_C	T_j = 25 °C, V_{GE}=20V	200	A
		T_j = 150 °C, V_{GE}=20V	100	A
Peak Collector Current	I_{CM}	Limited by T_{jmax}	TBD	A
Gate-Emitter Peak Voltage	V_{GE}		±30	V
SiC SBDs				
Maximum Reverse Voltage	V_{RRM}		1200	V
Average Forward Current	I_{DAV}	T_j = 25 °C	200	A
		T_j = 150 °C	100	A
Non-repetitive Forward Surge Current	I_{FSM}	t=10 ms	TBD	A
		T=10 μs	TBD	A
COPACK Modules Thermal Properties				
Maximum Power Dissipation	P_D	T_C = 25 °C	TBD	W
		T_C = 100 °C	TBD	W
Operating Junction Temperature	T_j		-40 ~ 175	°C
Storage Temperature	T_{STG}		-40 ~ 150	°C

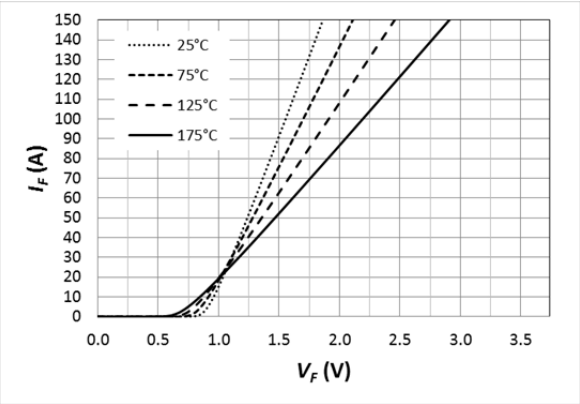
Electrical Characteristics (T_j=25°C unless otherwise specified)

Parameters	Symbol	Conditions	Min	Typ	Max	Units
Si IGBT						
Collector-Emitter Breakdown Voltage	V_{CES}	V_{GE}=0 V, I_C=100 μA	1250	--	--	V
Gate Threshold Voltage	$V_{GE(TH)}$	V_{CE}= 10 V, I_C=3.3 mA	5.0	--	6.8	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	V_{GE}= 15 V, I_C=100 A	--	1.8	2.25	V
Zero Gate Voltage Collector Current	I_{CSS}	V_{CE}=1200V, V_{GE}=0V, T_j = 25 °C	--	--	1	μA
		V_{CE}=1200V, V_{GE}=0V, T_j = 150 °C	--	TBD	--	μA
Gate Emitter Leakage Current	I_{GES}	V_{GE}=±30 V, V_{CE}=0V	--	--	±1	μA
Input Capacitance	C_{ISS}	V_{GE} = 0V, V_{CE} = 25 V, freq. = 1MHz	--	10	--	nF
Output Capacitance	C_{OSS}		--	0.28	--	nF
Reverse transfer Capacitance	C_{RES}		--	0.23	--	nF
Turn-on Delay Time	$t_{d(on)}$	V_{CE} = 600V, V_{GE} = ±15V I_C = 100A, $R_{G(ext)}$ = 10Ω, Inductive Load	--	70	--	ns
Rise Time	t_r		--	60	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	420	--	ns

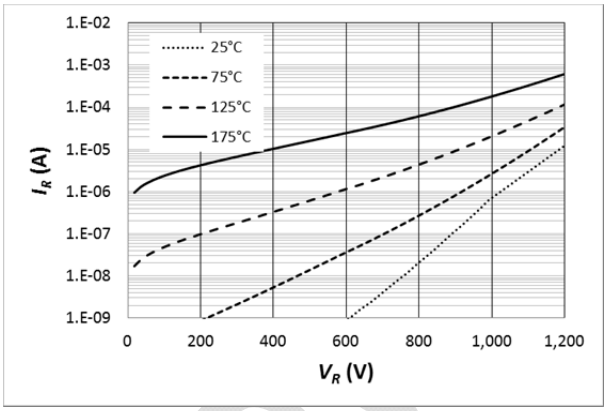
Fall Time	t_f		--	160	--	ns
Turn-on Switching Loss	E_{ON}			TBD		mJ
Turn-off Switching Loss	E_{OFF}			TBD		mJ
Total Gate Charge	Q_g	V_{CE}=600 V, V_{GE} = -5/20V I_C = 100A	--	900	--	nC
SiC SBDs						
Maximum peak repetitive reverse voltage	V_{RRM}		1200	--	--	V
Maximum Reverse Leakage Current	I_{RM}	V_R = 1200V, T_j = 25 ^{0}C	--	16	500	µA
		V_R = 1200V, T_j = 175 ^{0}C	--	580	--	µA
Diode Forward Voltage	V_F	I_F = 100A, T_j = 25 ^{0}C	--	1.6	1.8	V
		I_F = 100A, T_j = 175 ^{0}C	--	2.2	2.7	V
Total Capacitive Charge	Q_C	V_R=1200 V, I_F<$I_{F,max,}$ dI_F/dt = 500 A/µs, T_j = 25 ^{0}C	--	431	--	nC
Switching Time	t_C	dI_F/dt = 500 A/µs, T_j = 25 ^{0}C	--	--	10	ns
Total Capacitance	C	V_R = 1V, f = 1 MHz	--	6349	--	pF
		V_R = 600V, f = 1 MHz	--	370	--	pF
		V_R = 1200V, f = 1 MHz	--	359	--	pF

Thermal and Package Characteristics (T_j=25^{o}C unless otherwise specified)

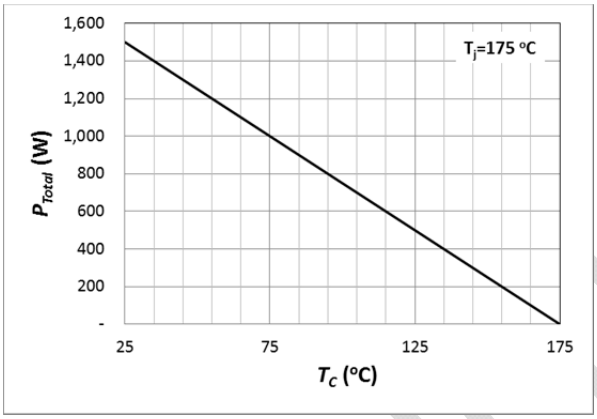
Parameters	Symbol	Conditions	Min	Typ	Max	Units
Junction to Case Thermal Resistance	R_{THJC}	IGBT	--	--	0.2	^{0}C /W
		SBD	--	--	0.3	^{0}C /W
		Per Module	--	--	TBD	^{0}C /W
Junction to Ambient Thermal Resistance	R_{THJA}	Per MOSFET	--	--	TBD	^{0}C /W
		Per SBD	--	--	TBD	^{0}C /W
		Per Module	--	--	TBD	^{0}C /W
Mounting Torque	M_d				1.5	N-m
Terminal Connection Torque	M_{dt}		1.3	--	1.5	N-m
Package Weight	W_t			32		g
Isolation Voltage	V_{ISOL}	I_{ISOL} < 1mA, 50/60Hz, t=1 min	2500			V



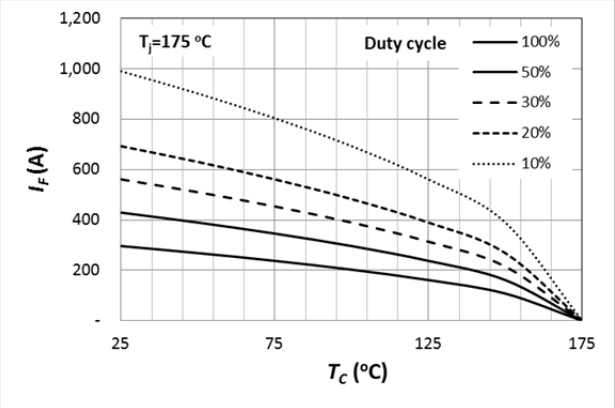
Forward Characteristics (parameterized on Tj)



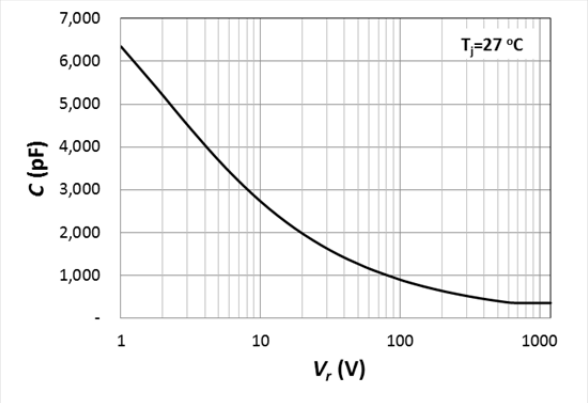
Reverse Characteristics (parameterized on Tj)



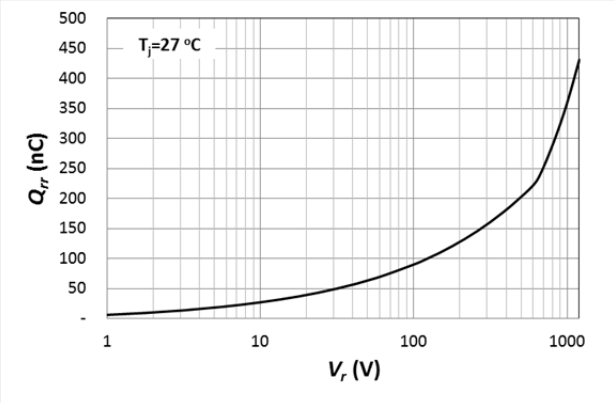
Power Derating



Current Derating



Capacitance Curve



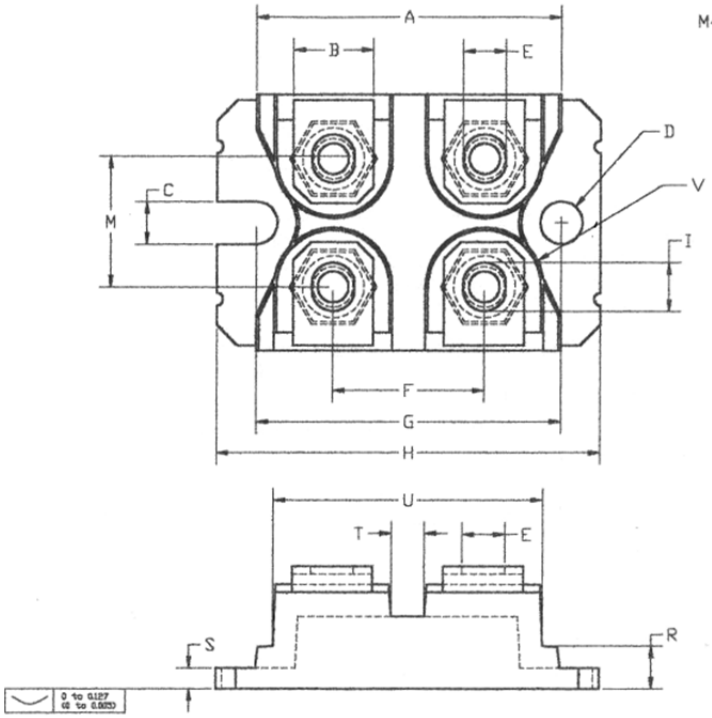
Recovery Charge

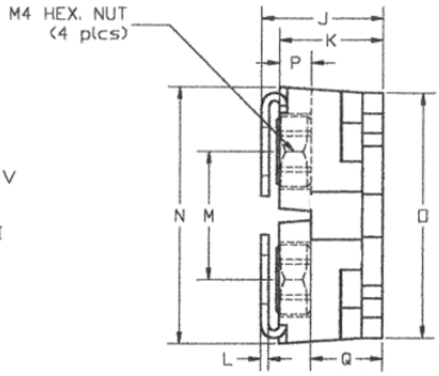
Part Number and Pin assignment

Part Number	Rating	Pin 1*	Pin 2	Pin 3	Pin 4*
GHIS100A120S1-E1	1200V, 100A	Source	Gate	Drain	Source

* pin 1 could be used as a kelvin reference terminal, and pin 4 is assigned for main source power terminal.

SOT-227 Package Outline and Dimension





DIM.	MILLIMETER Min.	MILLIMETER Max.	INCHES Min.	INCHES Max.
A	31.67	31.90	1.247	1.256
B	7.95	8.18	0.313	0.322
C	4.14	4.24	0.163	0.167
D	4.14	4.24	0.163	0.167
E	4.14	4.24	0.163	0.167
F	14.94	15.09	0.588	0.594
G	30.15	30.25	1.187	1.191
H	38.00	38.10	1.496	1.500
I	4.75	4.83	0.187	0.190
J	11.76	12.19	0.463	0.480
K	9.45	9.60	0.372	0.378
L	0.76	0.84	0.030	0.033
M	12.62	12.88	0.497	0.507
N	25.15	25.30	0990	0.996
O	24.79	25.04	0.976	0.986
P	2.74	3.15	0.108	0.124
Q	6.91	6.99	0.272	0.275
R	4.17	4.42	0.164	0.174
S	2.08	2.13	0.082	0.084
T	3.28	3.63	0.129	0.143
U	26.75	26.90	1.053	1.059
V	3.94	4.04	0.155	0.159

Revision History

Date	Revision	Notes
11/24/2014	1.0	Initial release

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Notes

- **RoHS Compliance**
  The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented March, 2013. RoHS Declarations for this product can be obtained from the Product Documentation sections of www.gptechgroup.com.

- **REACh Compliance**
  REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemi- cal Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future,please contact our office at GPTG Headquarters in Lake Forest, California to insure you get the most up-to-date REACh SVHC Declaration.
  REACh banned substance information (REACh Article 67) is also available upon request.

- This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control.

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